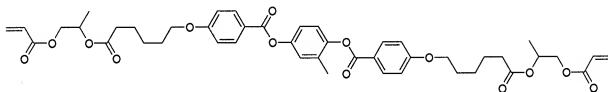


**REMARKS**

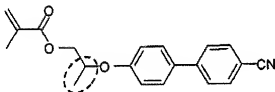
The recitation for A<sup>1</sup> to A<sup>3</sup> in the claims has been amended based on, e.g., the disclosure beginning at page 7, line 1 in the present application. The amendments of n1 to n4 and m1 to m3 in the claims are also based on the specification and especially, but not limited to, the specific additives of the present invention shown in the examples 1, 2, 4, 5 and 8:

*Additive No. 1 of example 1*



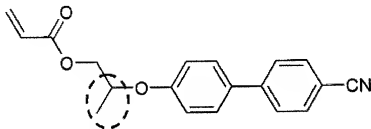
T<sub>iso</sub> : -38.2 °C

*Additive No. 2 of example 2*



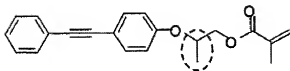
T<sub>iso</sub> : -28.3 °C

*Additive No. 4 of example 4*



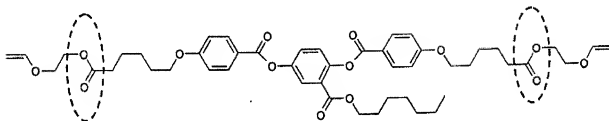
T<sub>iso</sub> : -28.1 °C

Additive No. 5 of example 5



T<sub>iso</sub> : -36.1 °C

Additive No. 8. of example 8



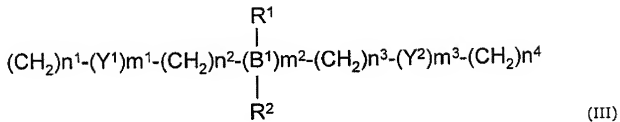
T<sub>iso</sub> : 10.2 °C

Entry of the above amendment is respectfully requested.

Novelty of present invention over US 6,733,690

The present invention relates to a mixture comprising:

- i) a cross-linkable liquid crystalline host comprising at least one cross-linkable liquid crystalline compound, and
- ii) at least one chiral or achiral rod shaped additive of formula (I),  
comprising a side chain (III)



“...wherein:

$Y^1$  and  $Y^2$  each independently represent -OCO- or -COO-,

$B^1$  represents C or CH, (*representing chiral group*)

$R^1$  and  $R^2$  each independently represent hydrogen or a  $C_1$ - $C_{12}$  alkyl residue, ...

$n^1, n^2, n^3$  and  $n^4$  are independently integers from 0 to 15,

such that  $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$ ;

with the proviso that

if  $m^1$  is 1 then  $n^1, n^2$  are independently integers from 1 to 15,

if  $m^3$  is 1 then  $n^3, n^4$  are independently integers from 1 to 15;

$m^1, m^2$  and  $m^3$  are independently integers from 0 to 1, such that

$1 \leq m^1 + m^2 + m^3 \leq 3$  and wherein:...”

The additive having an alkyl-ester-alkyl group:  $(CH_2)_n-(Y)m-(CH_2)_n$ , wherein

Y is -OCO- or -COO- and wherein

“.... if  $m^1$  is 1 then  $n^1, n^2$  are independently integers from 1 to 15,

if  $m^3$  is 1 then  $n^3, n^4$  are independently integers from 1 to 15...”

These achiral additives are shown with Additive Nos. 1 and 8 of the present invention.

The chiral additive has a chiral group:  $(R^1)-(B^1)m^2-(R^1)$ , wherein

$m^2$  is 1, and

“.... $n^1, n^2, n^3$  and  $n^4$  are 0 to 15 such that  $1 \leq n^1 + n^2 + n^3 + n^4 \leq 15$ ...”.

In the present invention these chiral additives are shown in Additive Nos. 1, 2, 4 and 5.

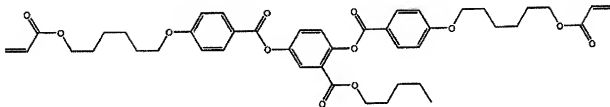
US 6,733,690 does not disclose a chiral or achiral compound having an alkyl-ester-alkyl group in its side chains.

All further claims, such as method and application claims, refer back to the mixture or compound of the invention.

Hence, the present invention is novel over US 6,733,690.

Non-obviousness over the teaching of US 6,733,690

US 6,733,690 describes in example 3 a liquid crystal compound of the following formula



This compound differs from the compound (I) of the present invention in:

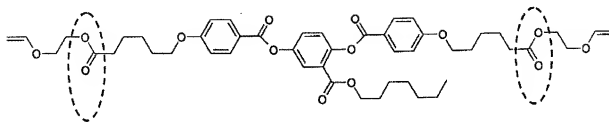
- this compound of US 6,733,690 is not chiral, and
- this compound does not comprise a side chain having an alkyl-ester-alkyl group, which is a  $(CH_2)n^1-(Y^1)m^1-(CH_2)n^2$  group or  $(CH_2)n^3-(Y^2)m^3-(CH_2)n^4$  group, wherein  $Y^1$  and  $Y^2$  are  $-OCO-$  or  $-COO-$ .

The compounds of the present invention differ not only in their chemical structure, but also have different transition temperatures to the isotropic state:

**a) Compound of example 3 of US 6,733,690 → transition temperature is 63°C;**

**whereas**

**b) Additive No. 8 of the present invention → transition temperature is 10°C;**



Additive No. 8

Very astonishingly, these additives having such low transition temperature were found.

They gave access to fine-tuned liquid crystalline mixtures by doping them with small amounts of these additives. Herewith the properties of liquid crystalline mixtures are optimized in their orientation potential: reduced time needed for orienting, without major changes to the physical properties of the whole mixture such as depression of the transition temperature, the clearing point, or a reduction of the thermal liquid crystalline range, etc.

A skilled person would not have arrived at the present additives and liquid crystal mixtures using the teaching of US 6,733,690, because the compounds of US 6,733,690 have all high clearing points, such as the compound of example 3 with 63°C.

It was much more surprisingly found in the present invention that with the novel additives the orientation property could significant be accelerated (see example 9 of the invention, on pages 57 to 60, wherein the orientation time of the doped mixture was 1 minute, whereas the mixture which was not doped needed 15 minutes) and the aligning properties could be significantly enhanced as shown in example 10 of the invention.

This high orientation in only 1 minute was accessed by a novel mixture of the invention, wherein only 2% of the additive was present.

This advantageous influence of low amounts of additives of the invention to a liquid crystal mixture could not be foreseen starting from the teaching of US 6,733,690.

Hence, the present invention is non-obvious over the teaching of US 6,733,690.

Thus, Applicants submit that the present invention is neither anticipated by nor obvious over the cited art, and withdrawal of these rejections is respectfully requested.

### **Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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**23373**

CUSTOMER NUMBER

Date: March 28, 2011

Respectfully submitted,



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